Implementation of an e-Learning Project in Tshwane South District: Towards a Paperless Classroom in South African Secondary Schools

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Abstract: An e-Learning project has been rolled out in Gauteng schools in an attempt to improve the quality of education and move towards paperless classrooms. The purpose of this study was to investigate the challenges faced by Tshwane South Secondary Schools associated with the implementation of the e-Learning project with a view to suggest possible solutions. The study followed a qualitative research approach with a case study research design. The study population consisted of teachers, school management team (SMT), and learners. Purposive sampling was used to select three teachers, six learners and three school management team members of the schools' e-Learning committees. Data was collected through individual semi-structure interviews and focus group interview. The Analysis, Design, Development, Implementation, and Evaluation model (ADDIE model) was used to provide a theoretical perspective on how instructional designers, training developers, and educators should design and develop a program such as e-Learning. The data was analysed using a thematic approach. The study found that teachers were not adequately trained prior to the implementation of e-Learning, which impacted negatively on the project. Teachers had difficulty in operating the smartboards and accessing the learning resources that has been loaded in the smartboards which affected the implementation of the project. The study concluded that poor planning on the site of Department of Basic Education has resulted into challenges that hampered the implementation of e-Learning. The study recommends extensive training of both learners and teachers in the use of e-Learning.

Keywords: Blended learning, e-Learning, paperless classroom, teaching, technology

1. Introduction

The use of e-Learning has emerged in the context of contemporary information technology and has been integrated into many schools' education programmes, to shift from traditional teaching to an electronic environment (Hošková-Mayerová and Rosická, 2015). The term 'e-Learning' is a contraction of 'electronic learning' and includes all forms of technology-enhanced learning. On the other hand, e-Learning is also described as the delivery of various education services through digital technology (Sharma and Hardia, 2013). Owing to the many benefits of e-Learning, in 2015 the Gauteng Provincial Government in South Africa revealed a plan to spend R800 million on implementing e-Learning initiatives for secondary schools throughout the Gauteng Province. This study investigated the implementation of e-Learning in Tshwane South secondary schools and identified challenges encountered, with a view to suggest possible solutions.

Globally, there is an increasing trend towards adopting and implementing e-Learning. Technological advances have led to improvements in the provisioning of relevant information for all educational stakeholders in various educational environments, promoting quality, and innovation in the educational context. Calvo and Villarreal (2018:26) argued that "the global shift to e-Learning was observed through improvement or replacement of traditional learning modes such as classroom experiences, textbook study, Compact Disk-Read-Only-Memory (CD-ROM), and traditional computer-based training via the online delivery of information, communication, education, and training". Therefore, the use of e-Learning brings an innovative way of teaching and learning, which benefit both teachers and learners.

In Nigeria, the implementation of e-Learning in schools faces certain challenges. Nwana (2008) reports infrastructural deficiencies and a shortage of facilities, including computers, computer laboratories, and online classrooms, particularly in secondary schools. Nwana (2008) makes some recommendations for e-Learning to be effective in Nigerian schools. Firstly, the government of Nigeria must embark on a massive computer literacy training programme nation-wide, particularly for teachers and learners at all levels. Additionally, the government must invest in paying internet connection fees to internet service providers, so that all classrooms are connected to the internet, and can support web-based instruction. Lastly, the government needs to employ

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specialists and technicians to take care of internet facilities, and equipment, and carry out routine repairs within educational facilities.

Other African countries such as Kenya have also tried to move from paper-based classrooms to e-Learning. According to Mingaine (2013), the government of Kenya places considerable emphasis on the importance of ICT in schools. The ministry of education took steps to support the implementation of the strategy, either by direct action, or through the various agencies with which it was working. However, the implementation of ICT in schools has remained elusive, since most schools were not connected to an electricity grid and had no capacity to buy the required infrastructure. Additionally, school leaders and teachers were computer illiterate or ignorant of technology in general. Learners and wider school communities are thus prevented from accessing the potential of ICT (Mingaine, 2013). In resolving the problem of lack of electricity and infrastructural issues, most of the schools have embarked on seeking donations from non-governmental organisations. Some of these organisations have even provided training to teachers to ensure that schools succeed.

In South Africa, the government invested in e-Learning in schools, while monitoring implementation, and providing teachers with the requisite skills through training and development. As part of the implementation process, the Gauteng Department of Education (GDE) invested R 724 million in the 2017/2018 financial year to continue the rollout of its e-Learning strategy. GDE has followed the global e-Learning trend with the vision of introducing what they termed “classrooms of the future." With e-Learning, the limitations of classical instructional methods could be overcome, and provide various advantages to the learner and the teacher. Schools can harness and use e-Learning as a complementary tool for supporting teaching and learning processes. Moreover, e-Learning has been lauded for enabling access to education and ICT (Calvo and Villarreal, 2018). In some instances, e-Learning can also increase learning efficiency. Through the various e-Learning tools, learners become engaged in knowledge construction, collaboration, and reflection (Hošková-Mayerová and Rosická, 2015). On the other hand, e-Learning is also claimed to be a factor contributing to knowledge retention. Students studying through e-Learning share an active learning culture, are positively motivated, and prefer obtaining knowledge and skills at the time, and via the method most suitable for them (Hošková-Mayerová and Rosická, 2015).

One of the major challenges in implementing e-Learning, or the use of technology for education in countries like the United Arab Emirates, was that most software or applications were developed in English (Muresan and Gogu, 2013). Although the majority of the population in the United Arab Emirates speaks and understands English, at the American International School, teachers came from several nationalities and from various Arab countries, and many of them could only understand Arabic. Teachers, therefore, needed to be trained to use the classroom management system in English. In addition, applications and materials had to be custom-developed in Arabic for the project of implementing tablets in classrooms, to enable effective e-Learning. In the context of this study, for South African teachers and learners, specifically in public schools, English is also a second or third language. This has proved a hindrance to the understanding of e-Learning practices. A major issue was the Mobile Device Management (MDM) of tablets within the classroom. Usually MDM is carried out by information technology staff, but in the case of schools, teachers were charged with managing students’ tablets in the classroom (Muresan and Gogu, 2013). Classroom control became a burning issue as students with tablets played games, used social networking sites, or otherwise wasted precious classroom time. Learners using digital technologies in the classroom are often distracted from focusing on their learning activities if teachers are not keeping them busy (Eyre, 2015). To address these issues, schools had to install a classroom management system whereby teachers could control students’ tablets, and ensure that they were using their class time effectively (Muresan and Gogu, 2013).

The advancement of ICT throughout the world encouraged many countries to integrate technology into the classroom to enhance teaching and learning (Tarus, 2011). Policy makers have put much effort into funding and providing computers, internet connectivity, interactive whiteboards, tablets, and other technological tools, which are valuable resources for teaching and learning in classrooms. These resources not only contribute to teaching and learning, but help to create an environment where learners can engage and interact actively with teachers and with each other globally, as opposed to the traditional way, in which learners were observers and listeners without the inclination to participate unless told to do so (Oyaid, 2009).

Ouma, Awvor and Kyambo (2013) emphasised that the more e-Learning is adopted by institutions worldwide, the more essential it is that an assessment of readiness be carried out to ensure successful implementation. In

simple terms, the level of readiness determines the success of implementation. Readiness speaks to a variety of factors such as physical infrastructure, technical expertise, and psychological preparedness (Mosa, Maharin and Ibrahim, 2016). Broadley (2012) insisted that in focusing on the state of readiness, it is imperative for teachers to be fully equipped with technical skills for the proper management of the e-Learning environment. In acquiring these skills, users must learn with technology rather than learn about technology. Learning with technology requires not only technical skills, but also the desire and motivation to use technology as a teaching and learning resource. It is thus imperative to ascertain the level of readiness for e-Learning, by examining teachers' and learners' technical capacity and attitude towards technology.

Cox (2010) observed that e-Learning can be effective if blended into schools' teaching and learning. Afshari, Bakar, Luan, Samah and Fooi (2009) indicated that productive learning is not determined by the greater availability of ICT in the classroom, but by the correct use of ICT; otherwise the whole initiative can be a waste of resources. The technological tools utilised in e-Learning present learners with an opportunity to study anywhere and at any time (Haßler, Major and Hennessy, 2015). Almalki and Williams (2012) maintain that ICT equips learners with flexible learning skills and problem-solving skills, at the same time encouraging collaborative learning. Thus, e-Learning can positively affect the teaching and learning environment and increase communication levels among users. This adoption brings about a higher rate of access to information among learners and teachers, and provides a rich environment for collaboration among students, both of which have been seen to improve academic standards (Trelease, 2016). Cox (2010) noted that mobile devices enable teaching to be less predetermined, as learners gain the courage to respond and react to their changing experiences and surroundings, and make the tasks assigned to them meaningful. This ensures that learning is personalised in accordance with the interests, preferences, and capabilities of learners. Kearney and Maher (2013) also discussed the educational use of mobile devices like smartphones, low-power computers, iPads, and tablets; the most commonly used mobile device being the tablet. Researchers such as Sharples, Milard, Arnedillo-Sanchez and Vavoula (2009:235) argued that "the use of tablets has been investigated, and teamwork, scaffolding, self-directed learning, and device personalisation were found to be important for learners". Clark and Luckin (2013) suggested that mobile technologies are more engaging and motivating than traditional classroom tools. Learners can use tablets anywhere and at any time to facilitate individual learning, while teachers can use the devices for scaffolding learning (Pegrum, Oakley and Faulkner, 2013). Additionally, the use of tablets offers a unique home-school connection, by providing students with a classroom experience that relates to the technology-saturated real world. Low-income and disadvantaged learners are afforded exposure to the devices during the implementation of e-Learning (Pegrum, Oakley and Faulkner, 2013; Sharples et al., 2009).

Mohanty (2011) agrees with Tarus (2011) that ICT use improves and enhances the quality of education and learning. Learners are highly motivated by the challenging and authentic subject content that can be presented through video and television. Learners are more easily engaged when multimedia computer software is used, infusing text, sound, and colourful moving images into the learning process, and thereby promoting higher thinking skills and creativity among users. Mohanty (2011) distinguishes between learning about computers and the internet, learning with computers and the internet, and learning through computers and the internet. In learning about computers and internet, learners master basic terms, concepts and operations, as well as the use of computers and of the keyboard and mouse. Knowledge of word processing, spreadsheets, database, and graphics programs should not be a challenge for learners and users. When learners are learning with computers and the internet, there must be evidence that they are able to manipulate the tools productively, through presentations, and the "use of curriculum-specific applications types such as educational games, drill and practice, simulations, tutorials, virtual laboratories, visualisations and graphical representations of abstract concepts, musical composition, and expert systems" (Almalki and Williams, 2012:33). This is achieved by enabling learners to interact with encyclopaedias, interactive maps, atlases, and electronic journals. Finally, the use of computers and internet simply affords learners with technological skills and other skills required for engaging with curriculum-related activities. For this reason, leaners are in a better position to search for additional information from the internet and strengthen their learning trajectory.

For the effective and successful implementation of e-Learning, teachers are mandated with the responsibility of making sure that the learning resources are designed, developed, and presented appropriately via a digital source (Wei and Yanyan, 2010). Teachers play an influential role in determining the success of a curriculum, as they are the ones to implement it and ensure that the needs of learners are met. Therefore, it is important to continuously engage and consult with teachers during the process of curriculum design, to ensure the suitability

and flexibility of the material. Teachers are there as facilitators to guide learners on the right path and to foster collaboration and interaction between them (Wei and Yanyan, 2010). Lastly, e-Learning will have a positive impact when teachers are able to make effective use of the technology in imparting knowledge and skills to their learners (Koole, 2009).

Learners are also expected to have the necessary skills to pursue and acquire new knowledge independently, and be able to use the knowledge acquired to make decisions. In acquiring knowledge, learners must identify various sources of information in applications, such as electronic media or video, and interact and communicate with each other, as well as network to open and expand communication channels. Edwards (2012) observed that learners, especially from disadvantaged backgrounds, might lack the skills and knowledge to use their devices, and be unable to access compatible software or apps and internet connectivity outside school hours to continue with learning activities at home. Therefore, it is imperative for learners to familiarise themselves with the appropriate elements of ICT, as it is their responsibility to ensure that they explore the various technological tools, and familiarise themselves with computers and the internet to make the work of teachers easier (Kituyi and Tusubira, 2013). The adoption of information technology increases the independence of learners, encouraging them to be active learners. Learners using technology are in a better space to access more efficient and better sources of information to enhance their studies. Internet access exposes learners to the latest information, online libraries, journals, as well as online visual classrooms (Markovic, 2010). E-learning is time saving and can save travel costs (Talebiana, Mohammadia and Rezvanfa, 2014). Additionally, e-Learning affords the learner the opportunity of studying whilst engaging in other daily commitments (Woldab, 2014).

2. Theoretical framework

With regard to theoretical framework, The ADDIE model by Aldoobie (2015) was used. This is one of the models that are familiar to instructional designers and training developers. The ADDIE model is grounded on five stages of a development process for building effective training and performance support tools namely, Analysis, Design, Development, Implementation, and Evaluation (Aldoobie, 2015). The ADDIE model suggests that the roll-out of a project such as e-Learning be cyclical, with the implementers engaging in all the stages. In the context of Tshwane South District, the GDE was supposed to engage in ADDIE's five stages, by ensuring that the project was analysed, its design was scrutinised, its development carefully structured, its implementation well planned, and lastly, that the entire implementation process was evaluated. However, effectively adopting the ADDIE model was an obstacle, as some schools were misinformed as to what e-Learning entails.

In this study, GDE did not give proper directive to implementers on how to follow the stages for successful implementation, and therefore, the ADDIE model was not fully used by GDE, due to poor planning and lack of research prior the implementation of the project. However, in the preparatory documents, GDE claimed to have adopted The ADDIE model. However, the model was not correctly implemented, which resulted into the failure of the implementation phase of the project. The most critical stage of the ADDIE model that GDE failed dismally was the analysis stage. In this stage, GDE was supposed to look at the nature of schools in the district and anticipate possible challenges the project may experience, and formulate possible solutions. However, GDE used a one-size-fit-all approach, which resulted in failure. When using the ADDIE model, each stage allows the implementers to reflect on the progress of the project and make appropriate corrections. If the model is followed correctly in a project, such a project is likely to succeed. In the context of this study, the ADDIE model is likely to yield recommendations on how the already implemented project might be revised, and all the challenges experienced could be overcome. The model gives a clear shortfall and it highlights areas that the project missed, and stages that were not fully implemented, which resulted in the failure.

3. Research methods

The study assumed a qualitative research approach with a case study research design. An interpretivist paradigm was followed, with emphasis placed on understanding the individual participants and their interpretation of the world. The population in this study consisted of school management teams, teachers, and learners. Purposive sampling was used to select three teachers, six learners and three School Management Team (SMT) members who were on the school's e-Learning committee. Data was collected through individual interviews (teachers and SMT) and focus group interviews (learners). Themes emerging from the responses were identified, analysed, and later used to guide the discussion. Issues of ethics were attended to by ensuring that participation was voluntary, the right to withdraw from participation and anonymity of participants.

4. Results

4.1 Learners' preparedness for e-Learning

For e-Learning implementation to be successful, it is imperative that learners be thoroughly prepared to operate and interact with the ICT tools. The following sub-themes and issues emerged from this theme: e-Learning, baseline knowledge and train the trainer.

4.2 Training of e-Learning

The study was conducted in township schools where most learners are from previously disadvantaged families and as a result, not all learners knew how to use the tablets. Therefore, it was important for learners to be trained in the use of tablets as well as in accessing applications through the tablets. In this study, it was found that learners were not trained in the use of tablets. **FG** mentioned that:

> *"We learners, we were not trained but we had the knowledge on how to use the tablets."*

Reflecting on above response, it becomes clear that the e-Learning training was only provided to teachers without considering learners. However, the use of e-mail involves both teachers and learners. Therefore, the training was supposed to be based on learners, teaching and SMT members. Researchers such as Eyre (2015) argue that most of the projects fail because of poor planning. In the context of this study, it was found that there was no proper planning which affected the analysis and evaluation phase of the project on the implementation of e-Learning. The ADDIE model suggests that for any successful implementation of the project, there should be proper analysis as well as evaluation which in this study were not properly done. On the other hand, if was found in this study that the SMT members and teachers were provided with training. However, it came out that the training was not adequate enough to help them master the skills. One of the teachers mentioned that "how can you give me one-week workshop and expect me to learn how to master the use of technology while I never used it before. We needed three months to learn these things". Reflecting on the ADDIE model, if the analysis phase of the project was done properly, such problems could have been avoided. For example, as part of analysis, GDE was supposed to conduct needs analysis with teachers and SMT members to found out duration that e-Learning trainings were supposed to take. The study of Broadley (2012) confirms that the success of any project is preparatory phase, which in the context of the ADDIE model is referred to as analysis phase.

4.3 Baseline knowledge

Instead of conducting formal training, schools relied on the baseline knowledge of learners in operating e-Learning resources. Baseline knowledge in the context of the ADDIE model is Analysis which was supposed to be done by GDE to find out the kind of prior knowledge both learners and teachers have in order to provide appropriate support (Aldoobie, 2015). Learners were concerned that they were not trained on the use of technological gadgets provided to them. Most learners relied on their prior knowledge which was difficult for learners that were using such equipments for the first time. The study of Sharma and Hardia (2013) confirms that learners who succeed on the use of technology are those that continued to use such gadgets even at home. On the other hand, teachers and SMT members found one-week training as not enough since they did not have any prior knowledge about the use of technology for teaching and learning.

This was confirmed by participant **FG1**:

> *"We learners, we were not trained but we had the knowledge on how to use the tablets because we have phones and the tablets they work like our phones."*

Reflecting on above response, it was assumed that all learners could use tablets as most of them had cellphones, and hence no training was offered. Researchers such as Edwards (2012) argue that learners can lack skills and knowledge of how to use their devices because of different and relatively deprived backgrounds. In the context of this study, Analysis stage as proposed by the ADDIE model was not properly done to find out the actual baseline knowledge of learners and teachers which has resulted into poor implementation of the project.

4.4 Train the trainer

Teachers and SMT members were of the view that the approach of train the trainer by GDE has failed. The biggest concern was that the teachers themselves did not master the skills of e-Learning, which became difficult

for them to transfer the knowledge to students. Sharma and Hardia (2013) in their study argue that the basic principle of train the trainer is mastery of knowledge. To enable successful implementation, it is important for all stakeholders to be trained to enable them to integrate e-Learning in teaching and learning. Views from some teachers indicated that a train-the-trainer approach was followed in preparing learners. However, teachers and school management team (SMT) were of the view that the training that was provided to them was not adequate for proper implementation.

FG mentioned that:

> *"We were trained for a week. How do you expect a one-week training to prepare us for proper implementation of e-Learning? The use of computers is complicated, we needed more time on the training."*

Similar to **FG**, **SMT1** also added that:

> *"Not necessarily. We were given tablets and introduced on how to use them and how to use the internet. Yes, they taught us how to get textbooks and watch videos for other subjects. They also show us how to connect to Wi-Fi and gave us a password that we use to put Wi-Fi on. However, during for workshop was not enough for old schoolteachers like us."*

The study revealed that teachers struggled to transfer knowledge they learnt from the workshop to learners because the training was not adequate for them to full implement the e-Learning project. Teachers further raised a concern that they did not have prior knowledge when it comes to e-Learning, then it was difficult for them to master all the skills in one week. Therefore, train the trainer process ultimately failed. The GDE was supposed to conduct Evaluation as suggested by the ADDIE model to ascertain if one-week training for teachers will be appropriate for them to implement train the trainer (Aldoobie, 2015). Therefore, since GDE has failed to implement this important stage of the ADDIE model the entire train the trainer did not yield positive results, and this was regarded as important aspect of the implementation of this e-Learning project.

5. Measures put in place by GDE

The success factors in e-Learning implementation depended on the kind of measures that the GDE had to put in place. The following were the main issues raised in this sub-theme: preparation for effective implementation, distribution of devices, and teacher training and support from ICT experts.

5.1 Preparation for effective implementation

Successful e-Learning implementation depends on the level of preparation and the measures that authorities put in place. In the context of the ADDIE model, this falls under the Development and Evaluation stages to check if everything was well developed prior the implementation of the project.

5.2 Distribution of devices

The study revealed that the distribution of devices was not fairly done. There were some schools that were still waiting for devices, which affected the implementation of the project. The study revealed that e-Learning implementation could not be successful unless all the learners at every school are allocated tablets and ICT devices.

FG mentioned that:

> *"All learners were given tablets and smartboards were put in classes".*

SMT2 also indicated with excitement that they were given tablets by the Department of Education. In their response, s/he stated that:

> *"At the beginning of the year, we were given tablets and a password to access Wi-Fi and we were also shown how to access the textbooks".*

Similar to what **FG** and **T1** mentioned, **T2**, **T3,** and **SMT3** asserted that the GDE ensured that teachers were given laptops, whilst learners were allocated tablets. Furthermore, smartboards were installed in each classroom. However, even though teachers were provided with laptops, it was not enough for them.

Some teachers such as **T1** further indicated that:

> *"Giving me a laptop and one-week training is not enough for old teacher like me was born before the technology"*.

Reflecting on the quotation above, it shows that even if resources were allocated on time in some schools, the issue of knowledge and skills to use such devices was still a challenge. Therefore, it can be argued that one-week training was not enough for teachers to master the skills of using technology. One aspect that emerged was that e-Learning could not succeed without the distribution of devices to schools and learners. This is confirmed by Mosa, Moharin and Ibrahim (2016), who indicate that the level of e-Learning readiness determines the success or failure of the implementation. This readiness involves a variety of factors including the physical infrastructure (in this instance including the availability of tablets), technical expertise and psychological readiness. However, the study showed that some schools were still waiting for devices however, they were expected to implement e-Learning as well. This shows poor Design and Analysis as articulated in the ADDIE model (Aldoobie, 2015).

5.3 Teacher training and support from ICT experts

Both teachers and SMT members were not happy about the training provided to schools. Moreover, it was revealed the ongoing support of ICT experts was given in clusters and not in each individual school. In other words, one ICT expert may be responsible for five schools or more, which forms a cluster. The implication of this was that when schools experienced some challenges, they did not get immediate attention or help, since ICT experts were overloaded. Participants also mentioned that they received assistance from ICT officials based in a cluster, which was not enough.

FG1 indicated that:

> *"Teachers went for one-week training and there are people at a cluster from department who are supporting them. These people from the department are also assisting with devices that are faulty. They also check if every device has the required textbooks. However, sometimes it becomes difficult to access these people because they are not only responsible for our school.*

Similarly, **T1** confirmed that support was enabled by Matthew Goniwe, an ICT expert that has been deployed to schools. In addition, **T3** stated workshops were conducted for professional development. The study further revealed that learners were able to benefit from the teachers' training and support from ICT officials, even though the ICT officials were sometimes not readily accessible. The placement of ICT experts in clusters was one of the measures that helped to ensure readiness (Mosa, Moharin and Ibrahim, 2016). However, the study showed that most of the learners that benefited from teachers' training were those with baseline knowledge when it came to the use of technology. The Analysis stage by the ADDIE model allows stakeholders to analysis the state of readiness prior the implementation of any project. In this case, it can be concluded that the Analysis stage of the ADDIE model was not properly done, as not all learners benefited from teachers' training.

5.4 Level of learners' preparedness to integrate e-Learning

The level of preparedness to integrate ICT in learning was also important in ensuring effective implementation. The following sub-theme and issues were raised: e-Learning expectations and learner excitement.

5.5 E-learning expectations

Teachers expected learners to have some background knowledge about the e-Learning or the use of computers for learning purposes. The study revealed that learners had some prior knowledge, and most of the learners already had smart phones at their disposal. However, there were some learners that were from disadvantaged families who saw the tablet for first time in class, which affected their ability to use these devices. Learners expected teachers to give them full support, while teachers were not properly trained. If the ADDIE model was adequately used, such issues would have been clarified prior the implementation of the project. The Evaluation stage of the ADDIE model allows for the project to evaluate its readiness and identify possible challenges that

could be encountered (Aldoobie, 2015). Both learners and teachers indicated that their expectations were not met.

FG mentioned that:

> *"Learners were ready to integrate e-Learning in the teaching and learning because we were looking forward for this, since they have been telling us for a long time that we will no longer be using books and chalkboard".*

In contrast, **SMT1** argued that the learners' expectations were not fully met because they were not trained. The GDE assumed that all learners are generally good with technology and they overlooked the community background of some learners. This reflects poor development as articulated by the ADDIE model.
In supporting the issue of continuous training for learners, **SMT2** mentioned that:

> *"Maybe we need to make sure that e-Learning starts at lower grades and orientation and motivation is offered to learners so that they can know the tablets and not for personal use like social media. E-learning will work best if leaners are also trained".*

This study found that learners' expectations were fulfilled through the provision of modern infrastructure and the distribution of devices to schools (Ameen, Willis and Abdullah, 2017). However, with regards to support, both learners and teachers were not happy because the GDE did not meet their expectations. The study of Woldab (2014) revealed that the success of e-Learning is not only the availability of resources but also on the human resource to maximise its use. In the context of Tshwane South District, the distribution of devises was done without providing proper training to teachers and learners. The ADDIE model regards this as the Developmental stage that should come before the actual presentation of the project.

5.6 Learner excitement

Learners were very excited and were looking forward for the implementation of e-Learning. Moreover, learners were found to be positive about the implementation because they were looking forward to innovative ways of teaching and learning.

FG indicated that:

> *"We were excited because we were told that the learning and teaching process will never be the same like it used to be. When they installed the smart-boards we became interested in knowing how they are working and that we will no longer inhale dust from chalk".*

SMT2 also indicated that they were ready for integration. His/her comment was as follows:

> *"We were ready. We wanted to be like other learners in private school. We are tired of textbooks. We didn't have a problem because we have phones and tablets at home so using internet is not a problem. The tablets are very easy and much easier to carry".*

The study found that learners were positive about the implementation of e-Learning and they were looking forward to benefit from it. Learners were excited, as the use of technology afforded them with easier ways of obtaining information for projects and assignments. The study by Darling-Hammond, Zielezinski and Goldman (2014) revealed that technology is an easier way of facilitating teaching and learning. Therefore, learners in this project were found to be eager and looked forward to the e-Learning implementation.

5.7 Challenges experienced when implementing e-Learning

To ensure the success of the process, it was important for the authorities to identify hindrances to implementation faced by schools. When responding to this issue, participants raised the following sub-theme and main issues: ICT resources for successful implementation, internet connectivity, theft of devices, and access to non-academic material.

5.8 ICT resources for e-Learning implementation

With regard to ICT resources, e-Learning also encountered challenges and it was important for those challenges to be addressed to obtain the desired results. Below are challenges that hindered the proper e-Learning implementation:

5.9 Internet connectivity

Participants (teachers, learners, and SMT members) complained about poor internet connectivity that affected their ability to work.

FG mentioned that:

> *"There is no internet connection available at school. Teachers are forced to use their own internet to find some educational and additional resources to enhance the subject".*

Internet connectivity was found to be one of the barriers impacting on implementation. The availability of internet connectivity could make it easier for learners to obtain information for assignments and projects. Al-Ghaith, Sanzogni and Sandhu (2010) mentioned that poor internet negatively impacts on teaching and learning. Prior to the implementation of this project, GDE was supposed to go through ADDIE's 5 stages, which would allow the analysis and design of project, check how it is developed and should be implemented, and evaluate its readiness for the actual implementation. Therefore, since the ADDIE model was not correctly used, some schools were still experiencing connectivity problems, which severely affected the implementation of the entire project.

5.10 Theft of devices

Both teachers and SMT members were of the view that the e-Learning project was planned without proper security measures, which resulted in theft of e-Learning devices. The theft of devices was found to be prevalent in the understudied schools, inevitably impacting on the implementation of e-Learning. The most challenging situation experienced by schools was the theft of devices.

FG indicated that:

> *"They are stealing the smartboards. Some learners are stealing the cables when the teacher is not in class. And we afraid to say who is stealing because they will hurt us after school".*

Similar to **FG**, **T1** stated that despite numerous efforts by the GDE to affect a successful project, theft of both the smartboards and tablets proved to be a major obstacle. **T2**, in his response, commented on the daily theft of tablets. He mentioned that:

> *"The tablets are the most challenging experience. Almost every day there is one or two tablets which get stolen and it becomes the problem of the school to investigate the matter until the tablet is retrieved. Some we do not even find them".*

The study also found that smartboards and tablets were stolen by communities around the schools. Rhema and Miliszewska (2010) argue that under-developed technological infrastructure affects implementation. For devices to be safe, high quality security features need to be embedded in the infrastructure. The ADDIE model gives opportunity for implementers of any project to do an analysis and evaluate possible risks prior the implementation of the project. In the context of this study, the Analysis and Evaluation stages were not properly done to deal with issues of safety of the devices provided to learners.

5.11 Access to non-academic material

Both teachers and SMT members were of the view that the tablets provided to learners were not used for academic purpose and it was difficult for teachers to monitor that. The distribution of devices to learners was meant to improve teaching and learning, and enable learners to obtain additional information for research projects and assignments. However, instead of using the tablets as envisaged, learners downloaded non-academic material that did not add value to their learning.

This was mentioned by participant **FG**, who stated that:

> *"Learners are downloading games in the tablets and they take a lot of space. And the games make textbooks to be deleted. We have downloaded WhatsApp. I think it takes space as well. And learners are always on WhatsApp especially when the teachers are not in class. The teachers are not monitoring the tablets. That's why some children are downloading games."*

In addition, **T1** expressed his concern that learners are unable to concentrate in class because of the irrelevant material they have on their tablets.

In his response, **T2** said:

> *"Learners find it a bit difficult to concentrate in class while they bring their tablets, instead of listening to the teacher or concentrating. They would rather use their tablets for other reasons".*

The study also found that learners were accessing non-academic material that distracted them from learning. Eyre (2015) raised a concern that learners were often distracted from their learning when not kept busy by teachers. He noted that learners saw class time as an opportunity to engage in social media and download material not related to learning. Such issues could have been avoided if the Analysis stage, as articulated by Aldoobie (2015) in the ADDIE model, was properly done prior to the actual design, and measures were put in place to deal with such challenges. For example, if the Analysis stage was properly done, the issue of a firewall should have been put in place to prohibit learners downloading non-academic stuff.

6. Conclusion

The study concluded that poor planning on the site of Department of Basic Education has resulted into challenges that hampered the implementation of e-Learning. Challenges revolved around the theft of devices, non-academic material being accessed by learners, and the lack of internet connectivity. It was important for community members and parents to be encouraged to protect school property. Furthermore, investing in infrastructure to protect the resources was vital. The study concluded that the department failed to have control over students' devices because there were no firewalls to restrict students from retrieving irrelevant material. Teachers were unable to control this situation, as there were no measures in place to enforce strict and correct usage of the devices. The irrelevant material downloaded by learners contributed to the disappearance of e-books and slow internet connectivity. The successful implementation depended on all learners having good internet connectivity. It was concluded that there was a need for funding to be secured for stable internet connectivity, to enable effective and successful e-Learning implementation.

7. Recommendations

The following recommendations are made:

- Training of teachers in e-Learning early on in their career;
- The ADDIE' model is recommended to assist with analysis of each individual school, to provide support that is context based;
- A firewall to be installed in the learners' devices that would deny learners access to download irrelevant material, such as movies and music;
- Security measures to be implemented at schools to safeguard the devices.

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